Eversource Affected System Operator (ASO) Studies

Challenges & Lessons Learnt about Technical Data and Models

Challenges	Lessons Learnt
Lack of or improper PSCAD model documentation provided with PSCAD model submission in PowerClerk. This caused Eversource to take longer time to understand the PSCAD model functionality and at times needed inverter manufacturer support to resolve PSCAD model related questions.	Eversource will now require PSCAD model documentation to be included with the PSCAD model submission
PSCAD Models were submitted in a .exe file format. Due to security reasons, Eversource does not run executable files from an external source. All customers who had submitted PSCAD models in .exe file format had to be informed to re-submit PSCAD models with the appropriate PSCAD file extensions. This resulted in additional time needed to validate PSCAD models.	Eversource will accept PSCAD Models containing the following files: Model documentation (.pdf) – REQUIRED! Site-specific PSCAD case (.pscx) – REQUIRED! Additional PSCAD model files (e.g. .pslx, .pswx, .obj, .lib, .dll) – as applicable OEM inverter configuration files (e.g. .txt, .pmvs, etc.) – as applicable

PSCAD Models were submitted with default parameters and was configured with default parameters by the inverter vendor. These PSCAD models were not configured to match the project one line diagram. Eversource had to spend significant time and effort to configure these PSCAD models to match their one line diagram as part of the PSCAD model validation process.	Eversource will only accept PSCAD models that are configured to be 'site-specific' and the models must match the project one line diagram in order to pass the PSCAD model validation process.
The voltage and frequency protection setpoints of the PSCAD model were not configured to match the ISO-NE SRD requirements. Eversource had to set the voltage and frequency setpoints of the PSCAD models to match the ISO-NE SRD resulting in delays in completing the PSCAD model validation process.	Eversource will only accept PSCAD models with all voltage and frequency protection setpoints set as per the ISO-NE mandated protection settings.
PSSE stability models not provided or incorrect for the >5MW DER projects. This caused additional time. For example: • REECB1 model is not acceptable	A stability model in standard PSSE Version 34 library format is required for projects 5MW or greater. The PSSE dynamic model file is in .dyr format including inverter stability models and voltage and frequency settings. Please refer to **Eversource Model & Technical Data Request List For Affected System Operator (ASO) Transmission Studies** for the acceptable PSSE stability models.

Missing and/or unclear information in the project one-line diagram.	Eversource requests all ASO Study participants to provide a stamped one-line diagram with special emphasis on including the following information:
	• Project total size (kW-AC and kWh if applicable)
	• GSU information (impedance, X/R, kVA, voltages, grounding)
	    • Rated kVA
	    • Impedance %Z
	    • X/R Ratio
	    • Rated winding voltages
	    • Taps (e.g., +/-2 steps, each at 2.5%)
	    • Winding configuration (ie. YNd1)
	    • Grounding (e.g., Neutral Ground Reactor Rating: 77Ω, X/R=4)
	• Inverter information (make, model, version, quantity, rated kW & kVA)
	• Presence of 32 or 32R directional power relay if applicable
	• Inverter trip settings for frequency and voltage
	• Inverter ride-through settings for frequency and voltage

BESS Project operating narratives were not clearly provided, such as the charging from the grid capability. Additional time and discussions with the customer needed to provide clarity on BESS operating narrative.	Eversource has formulated a detailed BESS related questionnaire that is to be submitted along with any DER application, thus making the study process more efficient.
PSSE and/or PSCAD models submitted do not match the project one-line diagram. Multiple options of one-line diagrams and models caused confusion and additional time to seek clarity from Customers.	Eversource requests all ASO Study participants to submit consistent technical data, one-line diagram and models for the ONE project option intended for Proposed Plan Application (PPA) approval.